Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for diagnosing the possibility of disease in a body part, the method comprising:

representing the body part with a grid having a plurality of finite elements;

using a model of the body part ~~, obtaining~~ to obtain a baseline electrical property associated with each of the plurality of finite elements for each of a plurality of current injections obtained with an electrode array;

calculating a set of weights associated with a particular one of the plurality of finite elements, the set of weights consisting of a plurality of weight factors wherein each of the plurality of weight factors is associated with each of the plurality of ~~each finite element has one weight factor for each~~ current injections ~~obtained with an electrode array, and each weight factor~~ and wherein each of the plurality of weight factors is determined based on ~~obtained from the~~ current density in the particular one of the plurality of finite elements;

~~obtaining a baseline electrical property associated with each of the current injections;~~

computing a diagnostic for [[at]] the particular one of the plurality of finite elements, ~~for each finite element~~ wherein the diagnostic is the sum over all of the plurality of current injections of the plurality of weight factors multiplied by a [[the]] ratio of the baseline electrical property to a measured electrical property ~~impedance~~; and

utilizing the diagnostic to diagnose the possibility of disease in a location in the body part associated with the particular one of the plurality of finite elements, wherein a [[the]] higher [[the]] value of the sum of the diagnostic [[,]] represents a [[the]] higher [[the]] possibility of disease at the location ~~of the associated finite element~~.

Claim 2 (canceled).

Claim 3 (original): The system of claim 1, wherein the measure electrical property is conditioned to compute the diagnostic.

Claim 4 (canceled).

Claim 5 (original): The method of claim 1, wherein, in the step of representing, the grid is a two dimensional grid.

Claim 6 (original): The method of claim 1, wherein, in the step of representing, the grid is a three dimensional grid.

Claim 7 (currently amended): The method of claim 1, wherein the baseline electrical property is obtained using a numerical model or a physical model of the body part.

Claim 8 (previously presented): The method of claim 1, wherein the baseline electrical property is obtained using a control subject.

Claim 9 (previously presented): The method of claim 1, wherein the baseline electrical property is obtained using a finite element method.

Claim 10 (currently amended): The method of claim 9, wherein the baseline electrical property is a baseline impedance obtained by:

obtaining a baseline voltage; and

using the baseline voltage to compute the [[a]] baseline impedance.

Claim 11 (original): The method of claim 10, wherein, in the step of obtaining a baseline electrical property, the model of the body part assumes a non-uniform resistivity.

Claim 12 (currently amended): The method of claim 1, further comprising:

applying a plurality of electrodes to the body part; and

obtaining the [[a]] measured electrical property of the body part with the plurality of electrodes.

Claim 13 (currently amended): The method of claim 1 [[12]], wherein the measured electrical property is obtained by ~~step of applying includes~~:

applying n_{CI} current injection electrode pairs on the body part, where n_{CI} is an integer greater than zero; and

applying n_{CI} voltage measurement electrode pairs on the body part,

wherein each of the current injection electrode pairs is associated with one of the n_{CI} voltage measurement electrode pairs.

Claim 14 (currently amended): The method of claim 13, wherein the step of obtaining the [[a]] measured electrical property includes:

injecting a first current between a first pair of the n_{CI} current injection electrode pairs;

measuring a [[the]] resultant voltage difference V_1^M between a [[the]] voltage measurement electrode pair associated with the first ~~current injection electrode~~ pair of the n_{CI} current injection electrode pairs;

repeating the preceding two steps of injecting and measuring with all [[the]] other electrode pairs until [[all]] n_{CI} voltage differences, $\{V_1^M, V_2^M, \ldots, V_{n_{CI}}^M\}$, are obtained; and

using the n_{CI} voltage differences to obtain associated measured impedances, $\{Z_1^M, Z_2^M, \ldots, Z_{n_{CI}}^M\}$, where Z_j^M is a [[the]] measured impedance obtained by using a [[the]] j^{th} current injection electrode pair and the voltage measurement electrode pair associated therewith.

Claim 15 (currently amended): The method of claim 14, wherein [[,]] if the particular one of the finite elements is identified as a [[the]] k^{th} finite element and the set of weights is

denoted by $\{w_{1k}, w_{2k}, \ldots, w_{n_{CI}k}\}_1$ where w_{ik} is a [[the]] weight factor associated with the k^{th} finite element and i^{th} current injection electrode pair, then the step of calculating ~~obtaining~~ a set of weights [[, ,]] includes:

using the model of the body part to obtain a set of current densities, $\{J_{1k}, J_{2k}, \ldots, J_{n_{CI}k}\}$, where J_{ik} is a [[the]] current density at the k^{th} finite element when current is injected between the i^{th} current injection electrode pair; and

obtaining the set of weights using the relation

$$w_{ik} = \frac{J_{ik}}{\sum_{j=1}^{n_{CI}} J_{jk}}.$$

Claim 16 (currently amended): The method of claim 15, wherein the step of obtaining a baseline electrical property includes:

using the model of the body part to obtain a set of baseline impedances $\{Z_1, Z_2, \ldots, Z_{n_{CI}}\}_1$ where Z_i is an [[the]] impedance associated with the i^{th} current injection electrode pair.

Claim 17 (currently amended): The method of claim 16, wherein the step of computing a diagnostic includes:

calculating an average of a function $f(Z_i, Z_i^M)$ at the k^{th} finite element, the average given by

$$\langle f_k \rangle = \sum_{i=1}^{n_{CI}} w_{ik} f(Z_i, Z_i^M),$$

wherein a [[the]] diagnostic at the k^{th} finite element is defined to be $\langle f_k \rangle$.

Claim 18 (original): The method of claim 17, wherein the function $f(Z_i, Z_i^M)$ is given by

$$f(Z_i, Z_i^M) = \frac{Z_i}{Z_i^M}.$$

Claim 19 (currently amended): The method of claim 17, further comprising:

obtaining diagnostics at all ~~each of the other~~ finite elements, wherein the step of utilizing the diagnostic includes:

averaging the diagnostics at each of the plurality of finite elements to find an averaged diagnostic $\langle f \rangle$; and

calculating a second averaged diagnostic, $\langle f_{\text{homo}} \rangle$, corresponding to a homologous body part.

Claim 20 (currently amended): The method of claim 19, wherein the step of utilizing the diagnostic further includes calculating a difference $\langle f \rangle - \langle f_{\text{homo}} \rangle$, wherein a [[the]] quantity $|\langle f \rangle - \langle f_{\text{homo}} \rangle|$ is indicative of a [[the]] possibility of disease in the body part or the homologous body part.

Claim 21 (currently amended): The method of claim 19, wherein the step of utilizing the diagnostic further includes calculating a quantity

$$\frac{\langle f \rangle - \langle f_{\text{homo}} \rangle}{\frac{1}{2}\left(\langle f \rangle + \langle f_{\text{homo}} \rangle\right)}$$

that is indicative of a [[the]] possibility of disease in the body part or the homologous body part.

Claims 22-42 (canceled).